

ADMIN RECORD

COMPOSITE OF TECHNICAL COMMENTS RECEIVED DURING COMMENT PERIOD

DEMONSTRATIONS PRIOR TO TRIAL BURN:

An area of concern on which we have received repeated comments relates to the ability of the facility to establish the incineration process as a proven technology. The facility has repeatedly stated that the proposed incineration process including the filter system is a proven technology. The following items are needed in order to support this statement.

1. Facility representatives have recently acknowledged the previous use of the fluidized bed incinerator to incinerate radioactive materials. This earlier use of the incinerator should be described in detail along with an explanation of why this information was not disclosed initially. The description should include:

- Analysis of all wastes and materials incinerated
- Operating ranges for all process variables
- Results of any emission monitoring conducted during the incineration period
- The purpose of the incineration run
- The incineration run protocol
- A summary of the results and conclusions drawn from this incineration

The trial burn plan also references extensive laboratory testing which was used to design the fluidized bed incinerators. A summary of the laboratory results should also be included.

2. The incinerator should be operated during a "shake-down" period prior to the trial burn. During this "shake-down" period the incinerator should only be used for non-hazardous materials. Explain how the incinerator will be tested prior to the trial burn to demonstrate operational readiness. Describe the length of testing, feed materials, and operating criteria which will be established for the "shake-down" period.

3. The ability of the fluidized bed process to destroy hazardous constituents and the ability of the HEPA filtration system to remove radioactive constituents should be supported by existing test data. The facility should provide any information previously collected on the destruction efficiency of the fluidized bed process, and the removal efficiency of the HEPA filtration process. Information is provided in the trial burn plan on the previous PCB incineration. However, summaries should also be provided on any trial burns conducted at other DOE facilities which relate to the fluidized bed process. With regards to HEPA filtration, the facility should provide information from controlled testing of the systems and representative data from other onsite uses of HEPA filtration. What other methods of particulate removal (ie. scrubbing, electrostatic precipitation) have been evaluated?

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WASTE FEED COMPOSITION:

1. The facility should provide a more detailed description of the waste streams which will be incinerated during on-going operations, including the current backlog and the waste streams proposed to be incinerated during normal production operations. What are the chemical compositions of these waste streams? What values exist for key incineration waste parameters such as heat content, chlorine content, radioactive constituents, ash content, solids content, viscosity, etc. What are the expected values for future waste streams and what are the existing values for wastes currently being stored for incineration?

2. During the trial burn period the incinerator's performance should be demonstrated on worst case waste streams. The facility will not be allowed to incinerate a waste category which has not been demonstrated during the trial burn process. The waste streams proposed for the trial burn do not adequately represent the actual wastes to be incinerated during on-going operations. Specific concerns are:

-Plutonium content: the trial burn process does not include any waste tests with plutonium waste streams. If the facility intends to incinerate plutonium-containing wastes in the future these should be included in the trial burn. Both liquid and solid waste streams containing radioactive constituents should be run during the trial burn. The demonstrations should be performed stepwise, with non-radioactive runs conducted first, followed by runs conducted on uranium-containing wastes, and lastly runs conducted on plutonium-containing wastes. The facility should report results demonstrating the incinerator's ability to successfully handle each step before proceeding onto additional wastes.

-Plastics, PVC, latex, and other solids: The solid materials used to make up the feed composition for the trial burn should be representative of actual solid waste streams which will be sent to the incinerator during on-going operations. Paper material is not representative of these wastes. The solid feed should be a composite of plastics, PVC, latex and other materials which are representative of types of wastes expected to be present during on-going operations.

-Other Radioactive Constituents: If the facility expects other radioactive constituents to be present in on-going operations these should be accounted for during the trial burn. The facility should either include these constituents in the trial burn feed or explain how these constituents are accounted for by demonstrations with uranium and plutonium.

-Chlorine Content: The trial burn plan proposes a maximum carbon tetrachloride content of 19%, and a maximum organic chloride content of 17.5%. Are these levels the maximum expected for actual waste streams? Again, the maximum levels should be demonstrated during the trial burn.

3. The feed composition for the trial burn runs should be described in detail. What will be the physical nature of the plutonium and uranium to be burned? What will be the radioactive levels and the isotopic distribution for these constituents? What total quantity of plutonium and uranium will be used?

4. During the feed process non-combustibles are sorted out and removed prior to the waste entering the incinerator. Describe how these non-combustibles are identified and where they are sent.

DESIGN:

1. The facility should describe the original design basis for the fluidized bed incinerator. What criteria were established for construction, materials, and performance? What quality control/quality assurance was used during design and construction?

2. The rationale behind the selection of certain process features should be presented. Specifically:

-Catalyst: Why is chromic oxide on alumina selected as the oxidation catalyst?

-Air Pollution Control: Why was the air pollution control system consisting of cyclones, a sintered metal filter, and a series of HEPA filters selected? Why does the system not include any wet scrubbing?

OPERATION:

1. The trial burn process proposes an operating temperature range of 500 to 610 degrees Centigrade in the primary reactor and 475 to 650 degrees Centigrade in the afterburner reactor. The trial burn plan explains that the incinerator is designed to achieve the required destruction at these lower operating temperatures. What design considerations have been chosen to allow for this lower temperature range? Specifically, the effects of catalytic oxidation and fluidization turbulence should be explained in order to support these lower temperatures.

2. The trial burn plan does not clearly state whether the cooling water system is isolated from the incinerator waste and emissions. Is the cooling water a closed system?

3. The trial burn should provide an estimate of the residence time in both the primary and secondary reactors.

4. The trial burn should justify the use of 100% excess air. Additional air serves as an added dilution to the process and should be taken into account when calculating the destruction removal efficiency.

CONTROL SYSTEM:

1. The HEPA filters should be continuously monitored for failure or build up. An indicator such as pressure drop across the HEPA filter should be monitored as a measure of the filter's performance. Monitoring of the filter system should be connected to the automatic waste feed cutoff system.

2. The automatic waste feed cut off system should fail closed so that if any of the monitoring devices should fail then the feed should shut off. The facility should explain how the control system is set to fail safe.

3. CO monitoring and control should be clearly explained. What will be the set points for the two stages of CO control? What CO levels are expected based on previous demonstration of the incinerator?

4. The trial burn plan states that waste is not allowed to be fed to the incinerator until the bed temperature has reached the allowable operating range. Explain how the feed to the bed is restricted during start-up and shut-down periods.

MONITORING:

- 1.The facility should calculate mass balances on the complete incinerator system as a check on the monitoring and analysis. In particular, component mass balances should be conducted on uranium and plutonium to assure that the radioactive constituents are completely tracked.
- 2.The analysis of ash and residues plays a key role in monitoring the incinerator's performance. Does the predicted ash level of 17.1 lb/hr represent strictly residues from the solid waste runs or are the liquid runs averaged with the solid runs? What hazardous and radioactive constituent levels are expected in the ash, cyclone residues, and filters? What parameters will the ash, cyclone residues, and filters be analyzed for?
3. The trial burn plan references that some waste streams will produce acidic compounds and must be neutralized in the bed. Acidic compounds formed during the incineration are neutralized in the bed material with sodium carbonate. Identify the waste components which can result in acid corrosion, and explain how the completeness of the neutralization process will be monitored. How will these waste components be identified and managed during on-going operations?
- 4.Radioactive monitoring should be described in more detail. What is the accuracy of the uranium monitoring and the plutonium monitoring? Have more accurate methods been investigated? What continuous radioactive monitoring is available and what type of continuous monitoring is in place? Will the offgas radioactive monitoring detect radionuclides in all forms? What monitoring is in place after all the HEPA filters?
- 5.The trial burn plan should explain how all monitoring will be documented so that a future record will exist for independent scrutiny.
- 6.All offgas analysis should be conducted by an EPA-approved laboratory. The facility should identify the laboratories which will be conducting the analysis.

EMISSIONS:

- 1.The facility should explain the HEPA filtration system in more detail. What are the limitations of the HEPA filters? How efficient is the filter system in removing particulates less than 0.3 microns? How are the filters tested? As stated previously the efficiencies of the filter system should be backed by actual data.
- 2.The facility should document the expected composition, levels, and rates of the incinerator emissions. These estimated emission levels should include calculations and assumptions. If dispersion is taken into account, the air dispersion model and assumptions should be clearly explained. Air modeling should be based on conservative assumptions. Are gaseous radioactive constituents expected to be present? If so, how will their release be prevented? How do these expected emission levels compare to background, total plant emissions, and established standards?
- 3.More information should be included on the particulate cyclones and the sintered metal filters. What is the expected particulate distribution and efficiency of each device? What is the pressure drop across each device?

ONGOING OPERATIONS:

1. The long term operations of any hazardous or mixed waste unit at the Rocky Flats Plant will be covered under a Colorado Hazardous Waste Permit. However, the fluidized bed incinerator is currently regulated as an interim status unit. The facility has expressed a need to begin on-going incineration after the trial burn but prior to the issuance of the hazardous waste permit under the interim status provisions. The facility should provide the rationale for the need to conduct this incineration under interim status. The facility should also provide a complete waste analysis of the materials which will be incinerated during this period and a complete description of how the incinerator will be operated. This description should include operating ranges for the incinerator control variables, operating protocols, the frequency of operation, and the monitoring and sampling which will be conducted. This incineration should not proceed until all information from the trial burn has been evaluated and the incinerator has demonstrated that it operates in accordance with all applicable standards. Provided this demonstration is made, the incinerator should operate as stringently as the conditions which are established in the trial burn.

2. The amount of waste proposed for incineration which is currently being stored should be clarified. As specified above these wastes should be completely characterized.

3. The facility has proposed that the incinerator be used for hazardous waste and low-level mixed waste and only for wastes produced on-site. The facility has not specified use of the incinerator for transuranic wastes or off-site wastes. The facility should clearly state whether or not they will request use of the fluidized bed incinerator for either transuranic wastes or any off-site wastes.

4. How will incineration residues (including ash, HEPA filters, waste drums, etc) be handled?

5. The incinerator and air pollution control equipment should be inspected after the trial burn for any signs of degradation. These procedures should be specified.

CONTINGENCY MEASURES:

1. The facility should describe the contingency measures which are in place to respond to any emergency situations. What are the response steps which will be taken to respond to a fire, spill, release or other emergency?

2. What precautions have been taken in the design and operation of the incinerator to prevent an emergency incident? Specifically, a past fire at the facility was related to an incineration operation. What procedures have been established with the fluidized bed to prevent such a reoccurrence?

3. What fail safe measures are in place regarding the filter system? Will the filter system remain effective during an emergency?

ALTERNATIVES

1. Incineration is the facility's proposed alternative to the practices of land disposal which have been used in the past. What other alternatives to fluidized bed incineration have been evaluated, and what are the long and short term results? The facility should evaluate both short term alternatives such as storage, or other existing onsite treatment, and long term alternatives such as offsite treatment, other forms of incineration, recycling, waste reduction, or other onsite treatment.